

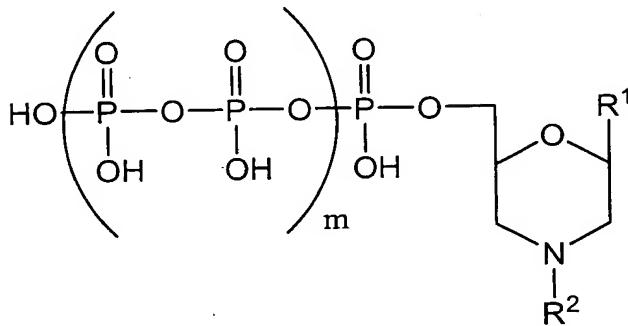
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Canceled).

Claim 2 (Previously Presented): A morpholino-nucleotide of the formula:



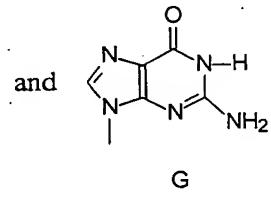
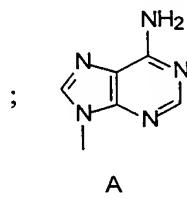
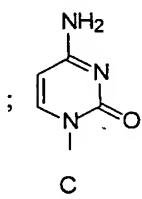
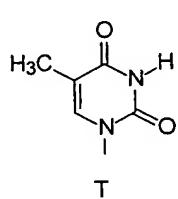
wherein R¹ represents a nucleic base, m is 0 or 1, and R² is selected from the group consisting of:

-(CH₂)_n-SR³, -(CH₂)_n-CO-R³, and -(CH₂)_n-OR³

in which n is an integer ranging from 1 to 12 and R³ is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

Claim 3 (Previously Presented): The morpholino-nucleotide of claim 2 wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

Claim 4 (Previously Presented): The morpholino-nucleotide of claim 2 wherein R¹ is selected from the group consisting of:



Claim 5 (Previously Presented): The morpholino-nucleotide of claim 2 wherein R³ is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.

Claim 6 (Previously Presented): The morpholino-nucleotide of claim 5 wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

Claim 7 (Previously Presented): The morpholino-nucleotide of claim 2 wherein R³ is a fluorophore.

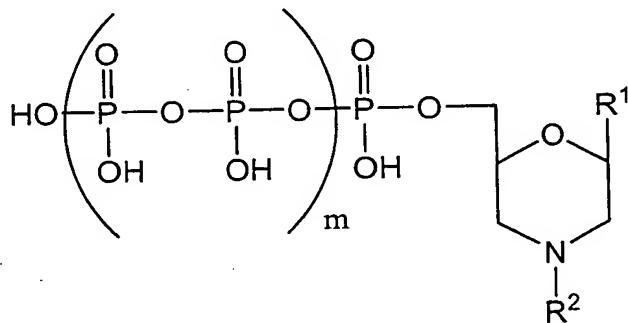
Claim 8 (Previously Presented): The morpholino-nucleotide of claim 7 wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

Claim 9 (Previously Presented): The morpholino-nucleotide of claim 2 wherein R³ is selected from the group consisting of fluorescein, biotin, and rhodamine.

Claim 10 (Previously Presented): The morpholino-nucleotide of claim 9 wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

Claim 11 (Previously Presented): The morpholino-nucleotide of claim 2 wherein m is 0.

Claim 12 (Previously Presented): A morpholino-nucleotide of the formula:



wherein R¹ is a natural nucleic base selected from the group consisting of guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine; m is 0 or 1; and R² is selected from the group consisting of:

-(CH₂)_n-NH-R³, -(CH₂)_n-SR³, -(CH₂)_n-CO-R³, and -(CH₂)_n-OR³

in which n is an integer ranging from 1 to 12 and R³ is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

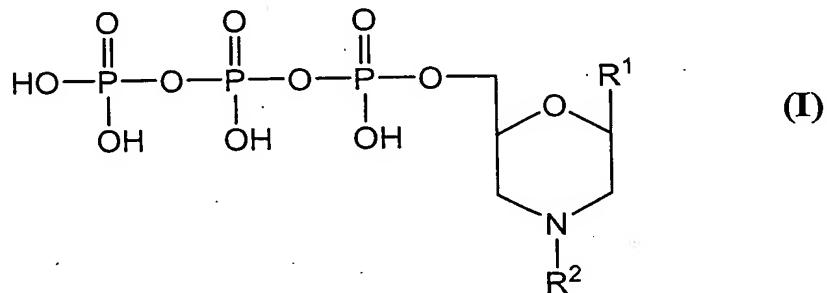
Claim 13 (Previously Presented): The morpholino-nucleotide of claim 12 wherein R³ is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.

Claim 14 (Previously Presented): The morpholino-nucleotide of claim 12 wherein R³ is a fluorophore.

Claim 15 (Previously Presented): The morpholino-nucleotide of claim 12 wherein R³ is selected from the group consisting of fluorescein, biotin, and rhodamine.

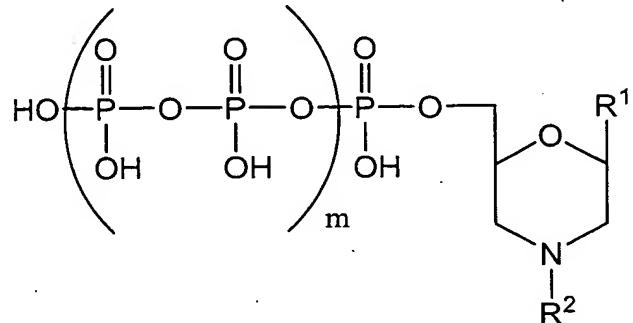
Claim 16 (Previously Presented): The morpholino-nucleotide of claim 12 wherein m is 0.

Claim 17 (Previously Presented): A morpholino-nucleotide of formula I:

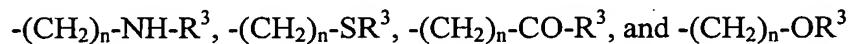


wherein R¹ is a nucleic base selected from the group consisting of adenine, guanine, cytosine, and thymine; R² is -(CH₂)₄-NH-R³; and R³ is -C(S)-NH-fluorescein.

Claim 18 (Previously Presented): A morpholino-nucleotide of the formula:

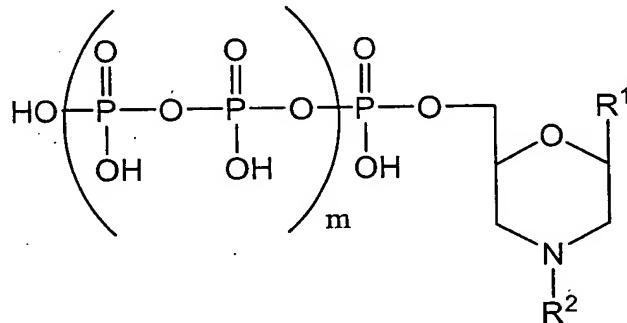


wherein R¹ represents a nucleic base, m is 0 or 1, and R² is selected from the group consisting of:

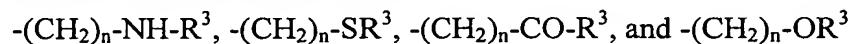


in which n is an integer ranging from 1 to 12 and R³ is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

Claim 19 (Previously Presented): A morpholino-nucleotide of the formula:



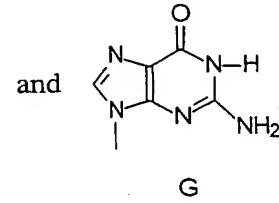
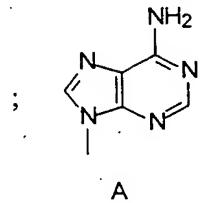
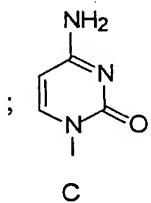
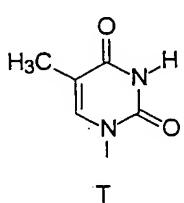
wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine; m is 0 or 1; and R² is selected from the group consisting of:



in which n is an integer ranging from 1 to 12 and R³ is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

Claim 20 (New): The morpholino-nucleotide of claim 18 wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

Claim 21 (New): The morpholino-nucleotide of claim 18 wherein R¹ is selected from the group consisting of:



Claim 22 (New): The morpholino-nucleotide of claim 18 wherein R³ is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.

Claim 23 (New): The morpholino-nucleotide of claim 22 wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

Claim 24 (New): The morpholino-nucleotide of claim 18 wherein R³ is a fluorophore.

Claim 25 (New): The morpholino-nucleotide of claim 24 wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

Claim 26 (New): The morpholino-nucleotide of claim 18 wherein R³ is selected from the group consisting of fluorescein, biotin, and rhodamine.

Claim 27 (New): The morpholino-nucleotide of claim 26 wherein R¹ is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

Claim 28 (New): The morpholino-nucleotide of claim 18 wherein m is 0.

Claim 29 (New): The morpholino-nucleotide of claim 19 wherein R³ is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.

Claim 30 (New): The morpholino-nucleotide of claim 19 wherein R³ is a fluorophore.

Claim 31 (New): The morpholino-nucleotide of claim 19 wherein R³ is selected from the group consisting of fluorescein, biotin, and rhodamine.

Claim 32 (New): The morpholino-nucleotide of claim 19 wherein m is 0.